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Bayesian Inference of a Nonhomogeneous Poisson Process with Exponential Model for Recurrent Events

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12

Bayesian Inference of a Nonhomogeneous Poisson Process with Exponential Model for Recurrent Events

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Abstract:
In the medical decision making, the event of primary interest is recurrent, so that for a given unit the event could be observed more than once during the study. In general, the successive times between failures of human physiological systems are not necessarily identically distributed. However, if any critical deterioration is detected, then the decision of when to take the intervention, given the costs of diagnosis and therapeutics, is of fundamental importance. In this paper, Bayesian inference of a nonhomogeneous Poisson process with exponential failure intensity function is used to describe the behavior of aging physiological systems with aging chronic disease. In addition, we illustrate our method with an analysis of data from a trial of immunotherapy in the treatment of chronic granulomatous disease. Finally, this paper develops a systematic way to integrate the expert's opinions which will furnish decision makers with valuable support for quality medical decision making.